GREVILLEA WILLISII (PROTEACEAE) A NEW VICTORIAN SPECIES

by

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SUMMARY

G. willisii is described, and its affinities with related taxa discussed. Habitat and other notes are given.

Grevillea willisii R. V. Smith et D. J. McGillivray, sp. nov.

Frutex erectus autem diffusus, 2·5 m altus × 3 m latus. Rami fusco-grisei vel griseo-brunnei; ramuli angulari-rotundati, saturate nigro-grisei, a pilis brevibus cirriformibus atque torquatis dense tomentosi. Laminae foliorum maturorum basin versus contractae, breviter sed anguste cuneatae, petiolis brevibus (3–6 mm longis) praeditae, rigidae, superne laete virentes, subter inter venas primarias dense contexto-tomentosae ob indumentum luteo-griseum usque fuligineum (venis mediis laminae atque loborum primariorum dense vel sparse pilosis ob tomentum laxiorem), lineamento—si lobis absentibus—plus minus ovato, 3–5 cm longae × 2–4 cm latae, profunde pinnatifidae in 3–9 lobos primarios; lobi primarii a simplicibus et oblongo-lanceolatis (vel anguste deltoideis) usque ad oblongo-cuneatos et apices versus trilobatos (interdum bilobatos) variantes —si quando trilobatus, lobus primarius infra medium usitate constrictus deinde in partem superiorem trilobatum dilatatus, lobulis ultimis ± triangularibus et ad apices breviter rigide pungentibus; margo folii firme recurvatus vel refractus; venae mediae folii atque eius lobi primarii infra fortiter prominentes, in superficie tenuiter sed clare notatae (praeterea, in superficie vena intramarginalis subtilis est sed ob recurvatum marginis folii aliquantum obscurata); foliæ juvenilia in superficie fortiter pubescentia (cf. folia veteriora sparse pilosa vel paene glabra). Inflorescentia 2–4 cm longa, dense spicata horizontalis cylindrata vel subsecunda, plerumque ramulum brevem foliatum terminans vel in axillis foliorum superiorum locata; rhachis lanata; bracteae florales breves (1–1·5 mm longae) crassae late ovato-rhomboideae concavae acutae, utrimque dense pilosae. Flores pedicellis dense pilosis brevibus (± 1·5 mm longis) praediti; perianthium plerumque fulvum vel paululum purpureo-brunneum, tamen ad summas laborum saturate purpureo-brunneum, extrinsecus a pilis appressis vel paulo expansis argenteis usque luteo-griseis instructum; tubus perianthii interne glaber, eius parte recta (usque ad summam arci) 4–5 mm longa et limbo ± 2 mm longo; antherae oblongo-lineares, ± 0·5 mm longae; torus paene rectus usque paulo obliquus; glans hypogyna semi-annularis glabra conspicue elevata, eius margine irregulariter lobato vel dentato; stylus 9–11 mm longus, perconspicuus glaber flavidus, parte inferiori plus minus recta sed parte superiori varie curvata vel arcuata, ad anthesin longitudinaliter canaliculatus, ad fructificationem teretior; discus stigmaticus perobliquus margine crenulato, stigmate conum humilem (± 0·5 mm altum) ad centrum terminanti; ovarium sessile vel subsessile ± 1 mm longum, a pilis longis erectis argenteo-albis dense obtectum. Fructus immaturi 4–5 mm longi, × 2–3 mm lati, oblique ovoideo-ellipsoidei, extrinsecus a pilis plus minus erectis vel expansis argenteo-griseis usque pallide luteo-griseis dense obtecti, atque vittis

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vel lineis distinctis irregularibus longitudinalibus pilorum nigro-purpureorum. Semina immatura 2 per fructum ± 3 mm longa × 1·5 mm lata, elliptica concavo-complanata pallide brunnea, ab ala irregulari sat lata stramineo-lutea et plus minus hyalina instructa.

(Latin description based on Holotype)

HOLOTYPE: VICTORIA: Bundara River Bridge on Omeo Highway, ca. 16 km N.W. of Omeo (direct), ca. 32 km by road from Omeo (close to 20 mile peg on Omeo Highway) 36° 59′S, 147° 29′E, altitude 645 m, *R. V. Smith 66/647*, 2.xii.1966. (Flowering and young fruiting stage). Erect spreading shrub 2·5 m high, and 3 m across. Leaves bright green above, felted grey below. Flowers in horizontal terminal spikes. Corolla pale fawny yellow. Style pale yellow. Young fruit green with dark almost blackish-purple streaks. Growing amongst large granite rocks by side of road close to Bundara Bridge, in association with *Eucalyptus dives*, *E. rubida*, etc. (MEL 501409).

ISOTYPES: To be distributed A, B, CANB, K, MEL, NSW.

PARATYPE: Ibidem—*R. V. Smith 65/20*, 21.i.1965. (Mature fruiting stage). Erect to somewhat decumbent spreading shrubs, 1–3 m high, and up to 2·7 m across. Fruits softly pubescent almost sessile, horizontally spreading, yellowish-green with dark purple almost black longitudinal markings and stripes. Growing amongst large granite rock boulders and outcrops above the Bundara River; in association with *Eucalyptus dives* and *E. rubida*, together with *Acacia dealbata*, *Bursaria spinosa*, *Daviesia latifolia*, etc. (MEL 501412).

Duplicates to be distributed as above.

ENGLISH DESCRIPTION (Based on *R. V. Smith 66/647*, *R. V. Smith 65/20*, together with several other Bundara Bridge specimens. (q.v. under SPECIMENS EXAMINED):

Large spreading shrubs, mostly erect but occasionally decumbent, 1–3 m high, and 2–3 m across. *Stems* with a flaky dark grey bark. *Branches* rounded or slightly angled, densely tomentose with short curled and twisted hairs, and varying in colour from pale grey to dark charcoal-grey, or sometimes almost black. (See also under NOTES.) *Branchlets* and young shoots strongly angular-rounded, varying in colour from dark charcoal-grey to pale grey, light yellowish-grey, light ferruginous or even pinkish-red. *Leaves* on petioles 2–6 mm long. Young leaves often ferruginous or pinkish-red in colour, densely pubescent on upper surface with short curled and twisted hairs; intermediate leaves sparsely pubescent above; mature leaves vary from almost completely glabrous above to very slightly pubescent towards the base, or with scattered hairs elsewhere. Laminae of mature leaves rigid, bright green subshining above, densely felted tomentose beneath in between the main veins with a tomentum of short curled or twisted hairs, varying in colour from whitish-grey to yellowish-grey,

or charcoal-grey ; main midrib and midveins of primary lobes densely to sparsely hairy with a generally looser tomentum than rest of undersurface. Where tomentum of midrib and other main veins sparse, midrib shows a ± straw coloured top, and narrow bands of green tissue down the sides ; where midrib tomentum dense this is completely masked. Leaves tapering below into a short narrow cuneate base ; laminae ± ovate in basic outline (outline if lobes not present) ; 3–5 (–6) cm long, 2–4 (–5) cm wide, deeply pinnatifidly lobed into (3–) 5–7 (–9) primary lobes—these varying from a regular arrangement of (1–) 2–3 (–4) pairs of lateral lobes together with a single trifid terminal lobe ; to an irregular arrangement of ± alternately placed lobes. Primary leaf lobes vary from simple oblong-lanceolate or deltoid in shape, to ± oblong-cuneate with a trilobed tip—in the latter case the lobes are often constricted below the middle, and widen upwards into the trilobed tip—the ultimate lobes being ± triangular in shape, and terminating in a short rigid mucronate point. Leaf lobing is often very irregular. Even on one leaf the primary lobes may be entire, bilobed or trilobed ; or again adjacent leaves may show the primary lobes all entire on one leaf, but regularly trilobed on a neighbouring leaf. Primary leaf lobes 1–1·5 (–2) cm long, (3–) 4–6 (–7) mm at narrowest width, and (5mm) 7 mm—15 mm (–17 mm) at broadest width. Leaf margin strongly recurved or refracted. Main midrib and midveins of primary lobes strongly projecting on lower surface ; midveins of secondary lobes and also a short vein running from junction of midrib and midvein of each primary lobe to base of sinus, clearly visible but not strongly projecting. In addition short lateral veins sometimes faintly discernible. On upper surface main veins clearly but finely marked, and in addition a well defined intra-marginal vein which is often somewhat obscured by the recurvature or refracture of the leaf margin. All other veins obscure on upper surface. *Inflorescence* a dense cylindric or subsecund horizontal spike (1–) 2–4 (–5) cm long, mostly terminating short leafy shoots or branches, or in the axils of upper leaves, and borne on short stalks 1–5 mm long—in some cases the short flowering shoot bears only several minute incipient leaves or bracts, and then the inflorescence stalk appears longer—varying from 5 mm to 15 mm. Flower spikes range from about 50 to 150 flowers; *rhachis* densely lanate with irregularly spreading curled or twisted hairs; *bracts* short broadly ovate to ovate-rhomboid, concave, bluntly pointed to acute, rather thick and rigid, densely hairy on both surfaces, (1–) 1·5 (–2) mm long. *Flowers* on densely hairy *pedicels* (1–) 1·5 (–2) mm long. Pedicels generally at least as long as bracts or slightly exceeding them. *Perianth* hairy outside, pale yellow to tawny or slightly purplish-brown tinged on tube, dark purplish-brown or purple tinged at tip, with ± appressed hairs slightly spreading at tips, and varying in colour from silvery to pale yellowish grey to purple tinged. Perianth tube glabrous

PLATE 7

Holotype of *Grevillea willisii*—Bundara River Bridge, Victoria.

inside, in some tawny to purple-brown, in others pale yellowish in upper part, and strongly purple tinged in lower part. Perianth ca. 7 mm long—tube (from base to top of arch) (3–) 4–5 mm long, limb ca. 2 mm long. *Anthers* linear—oblong, ca. 0·5 mm long. *Torus* varies from almost straight to slightly oblique. *Hypogynous gland* semi-annular, glabrous, conspicuously raised and with an irregularly lobed or dentate margin. *Ovary* sessile to subsessile, ca. 1 mm long, densely covered with long straight silvery-white erect hairs. *Style* 9–11 mm long, very conspicuous, clear pale yellow when fresh, pale yellow to slightly dingy yellow when dry, glabrous, longitudinally grooved in the flowering stage, becoming smoother and more rounded in the fruiting stage; at first strongly arched but straightening out in the lower part with maturity, although generally with the tip remaining bent over or variously curved or twisted. *Stigmatic disc* [*or pollen presenter*—a term recently adopted by A. S. George (1974)] ca. 0·7 mm wide, very oblique, with a crenulate margin, and rising in the middle to a prominent low cone ca. 0·5 mm high, at summit of which is the stigmatic area. Cone in some cases rising fairly gently, in others contracting rather suddenly and sharply to the summit. *Mature fruits* horizontally spreading, obliquely ovoid-ellipsoidal in shape, thinly woody 9–11 mm long × 6–7 mm wide, densely hairy outside with ± straight ascending to quite strongly spreading hairs, varying from pale silvery-grey to yellowish-grey, pale yellow or greenish grey, and with distinct irregular longitudinal streaks or bands of dark purple, purplish-black or very dark brown hairs. *Seeds* 2 per fruit, 6–8 mm long × 3–4 mm wide, dark brown to almost black, elliptical, compressed, glabrous, very finely wrinkled on the gently convex outer face, and on the ± flattened central part of inner face. In addition, on the inner face there is sometimes an elliptical groove or furrow just in from the margin, and occasionally beyond this again a low raised elliptical wall or thickening. Margin of seed thickened, and with a somewhat irregular pale yellow hyaline wing—more apparent in the immature than in the mature seed (in the latter its seems to break down somewhat).

HABITAT NOTES: (From R. V. Smith field notes 21-22.i.1965)

G. willisii occurs in abundance in the vicinity of the Bundara River Bridge, where it grows among large granite outcrops and boulders, but in a number of different aspects, slopes and plant associations. It occurs on both sides of the river.

West side of Bundara River: Growing on steep rocky slopes of easterly aspect about the river, in association with *Eucalyptus dives* and *E. rubida*, together with *Acacia dealbata, Bursaria spinosa, Daviesia latifolia, and Micrantheum hexandrum.* It extends on to the more gentle rocky slopes of northerly aspect, where it grows in association with *Eucalyptus dives* and *E. rubida*, together with *Brachyloma daphnoides*, and *Themeda australis*. **East side of Bundara River:** Growing among very large

PLATE 8

Paratype of *Grevillea willisii*—Bundara River Bridge, Victoria.

granite boulders close to the bridge, in association with *Busaria spinosa, Banksia canei* and *Correa lawrenciana.* Further upstream growing on steep westerly slopes above river among rocky outcrops and boulders, in association with *Eucalyptus rubida* and *E. macrorhyncha,* together with *Bursaria spinosa, Daviesia latifolia, Tieghemopanax sambucifolius* and *Correa sp.* Extends to the top of the steep rocky slopes above river, and then over on to gentle open slopes beyond into a stand of pure *E. rubida,* together with *Bursaria spinosa, Brachyloma daphnoides* and *Themeda australis.* Occurs also on rocky outcrops of northerly aspect, again in association with *Eucalyptus rubida* and *E. macrorhyncha,* together with *Bursaria spinosa, Brachyloma daphnoides, Daviesia latifolia, Acacia buxifolia* and *Cassinia longifolia.*

The Bundara River Bridge occurrence of *G. willisii* appears to be very localised. It was not noted between Anglers Rest and Bundara Bridge. About 0·4–0·8 km N.W. of Bundara Bridge on Omeo Highway (between 20 and 21 mile pegs) a fairly extensive patch of *G. willisii* was found growing among rock outcrops both above and below the road. Beyond this point on the Omeo Highway no other occurrences were seen.

Specimens Examined: Bundara River area: Omeo Highway (Bundarra Bridge), *R. A. Black,* 10.xi.1939 (MEL 501460) [Flowering material]; near Omeo at Blue Duck Hotel (Anglers Rest), junction of Bundarrah and Big River, *S. M. Fawcett,* xi.1944 (MEL 501459) [Flowering material]; at junction of the Bundarrah and Mitta Mitta (or Big) Rivers, *H. I. Aston 1259,* 23.xi.1964 (MEL 501458); Bundarra River Bridge ca. 16 km N.W. of Omeo, 36° 59′S, 147° 29′E, alt. 645 metres, *L. A. S. Johnson 7398 & B. G. Briggs,* 20.x.1971. Very spreading, to 3 m tall or more, to almost 3 m in diameter, styles and perianth greenish-cream, on pink granite on slopes near river, in woodland of *Eucalyptus rubida* and *Eucalyptus pauciflora* with *E. dives, E. macrorhyncha* and *E. radiata* ssp. *robertsonii* also in the area (NSW) [Flowering material].

Other Localities: Junction of Livingstone Creek and Mitta Mitta River (ca. 16 km north of Omeo). On metamorphic schist (quartzites), on rocky bluff. Altitude 792 m. Straggling shrub 1–2 m high. *J. Stirling 112,* 1.ix.1882 (MEL 501461). [Vegetative material with very young bud spikes, showing floral bracts, tomentum of lower surface of leaves strongly ferruginous. The collection is interesting as it appears to be the earliest record we have for *G. willisii*]; Upper Mitta Mitta, *Clinton,* xii.1923 (FRI 16293); Victorian Alps, *R. Tate* (undated) (MANCH); Cobungra, *H. Morgan,* xi.1932 (as *Grevillea ramosissima* Meisn.) [Herb, A. C. Beauglehole, 7385—ex Herb. J. Galbraith].

DISCUSSION OF AFFINITIES

On Bentham's classification of *Grevillea*, *G. willisii* belongs to the Section *Eugrevillea*, and to the Series *Hebegynae*. This series includes a number of prickle lobed or " holly-leaved " species—in Victoria *G. repens*, *G. aquifolium*, *G. ilicifolia*, *G. steiglitziana*, *G. dryophylla;* and outside Victoria *G. acanthifolia* and *G. bipinnatifida.*

From all of the abovementioned Victorian species *G. willisii* differs in having the following characters (1) sessile or subsessile ovary (2) pale yellow styles (3) stigmatic disc either round or broadly ovate-oblong in outline (viewed from above), and rising in the middle to a conspicuous cone which is frequently sharply conic or rostrate-conic (cf. the other species with conspicuously stipitate ovaries, red styles, and with the stigmatic disc elongated longitudinally, varying from ovate to elliptic or elliptic-oblong in general outline, and rising in the middle to a *low blunt* cone). The densely packed flower spike with numerous relatively small flowers, deeply pinnatifidly lobed leaves, and the dense felted tomentum of the underside of the leaves are some of the minor characters which further distinguish *G. willisii* from the other Victorian holly-leaved species.

From *G. acanthifolia* of New South Wales, *G. willisii* differs in the much smaller flowers, shorter pale yellow styles, smaller floral bracts, sessile to subsessile ovary, the longer and often more sharply conic stigmatic disc (cf. the low blunt cone of *G. acanthifolia*), tomentum of perianth limb (short flat lying hairs compared to long spreading hairs in *G. acanthifolia*), and in the densely felted undersurface of the leaves (glabrous or nearly so in *G. acanthifolia).*

From *G. bipinnatifida* of Western Australia *G. willisii* differs in the short compact inflorescence (long, loose, open and somewhat interrupted in *G. bipinnatifida*), shorter pedicels, shorter styles, form of stigmatic disc and hypogynous gland, leaf dissection, tomentum, etc.

The curious conical stigmatic disc of *G. willisii* could suggest affinities with the Section *Conogyne.* This section is characterized however by a cylindric instead of secund inflorescence, and by the total length of sigmatic disc and cone at least equal to or exceeding the greatest width. (In *G. willisii* total length of stigmatic disc and cone is generally shorter than the greatest width, or just equal to it, but not exceeding it.) The majority of the *Conogyne* species are from Western Australia, and combine a glabrous stipitate ovary with the lack of a hypogynous gland. Exceptions are the eastern species *G. ramosissima* and *G. triternata* with hairy ovaries.

From both these species *G. willisii* can be readily distinguished. *G. willisii* differs from *G. ramosissima* in the shorter stigmatic

cone, glabrous instead of hairy style, short secund instead of narrow cylindric flower spike, leaf shape and lobing, tomentum, etc., and differs from *G. triternata* in the secund inflorescence, perianth revolute under limb instead of recurved, sessile instead of shortly stipitate ovary, leaf shape and lobing, tomentum, etc.

G. willisii shows closest affinities to two undescribed taxa—one from Mount Stradbroke, Eastern Victoria, and the other from the Nunninong Plateau area, Eastern Victoria. These taxa are represented in the National Herbarium, Melbourne by three collections made by J. H. Willis, as follows:—

Mount Stradbroke (ca. 16 km north of Wulgulmerang), far Eastern Victoria. Eastern rocky declivities above Suggan Buggan Valley, at ca. 1220 m elevation. *J. H. Willis*, 23.ii.1962 (MEL 501462); Reedy River Valley below Brumby Point, Nunniong Plateau area, far Eastern Victoria. On quartzite cliff faces at ca. 1037 m altitude. *J. H. Willis*, 13.xi.1964 (MEL 501463); and Reedy River gorge, Nunniong Plateau area, far Eastern Victoria. Among rocks above river, at ca. 915 m altitude. *J. H. Willis*, 13.xi.1964 (MEL 501464 and MEL 501465).

The status of these taxa will be decided after field studies, and collection of more adequate material. Briefly, however, the Mount Stradbroke plants differ from *G. willisii* principally in the shape and size of the floral bracts; in the relative length of flowering pedicel to bract (in *G. willisii* the bracts are generally as long as or slightly shorter than the pedicels, whereas in the Mount Stradbroke plant the bracts greatly exceed the pedicels); in the strongly and sharply angled upper branches; in leaf shape and lobing; in the predominantly flat lying hairs of stems and leaf midribs; and in the silky hairy vestiture of the inflorescence. The Nunniong plants resemble the Stradbroke plant in leaf shape and lobing, prominently projecting midrib and midveins of main leaf lobes, predominantly flat lying hairs of stems, midribs and flower rhachis, but differs from the Stradbroke plants in the very small readily deciduous bracts which are very much shorter than the flower pedicels.

NOTES

Grevillea willisii and **G. ramosissima:** In the past at Melbourne Herbarium several specimens of *G. willisii* were incorrectly determined as *G. ramosissima*. These two species differ markedly in floral structure. The Victorian form of *G. ramosissima* (from Pine Mtn.) is readily distinguishable on vegetative characters—with its silvery silky undersurface to the leaves, narrow tapering leaf lobes bearing long pungent points, etc. However, some forms of *G. ramosissima* from New South Wales superficially resemble *G. willisii* in vegetative characters. These forms have a dense tomentum of curled twisted, often ferruginous, hairs on under surface of leaves. They can, however, nearly always be distinguished by the narrow tapering leaf lobes, the much longer pungent leaf tips, and the longer more narrowly

tapering leaf base which runs down into narrow decurrent wings almost to the base of the petiole.

Grevillea flavistyla: A suggested manuscript name for *G. willisii* at one stage was *G. flavistyla.* This name appeared in The Distribution of Victorian Plants (D. M. Churchill and A. de Corona, 1972). The name is a *nomen nudum.*

Rock Grevillea: Willis (1972) deals briefly with the present species under *G. sp.* Vern: Rock Grevillea.

Correct Spelling of Bundara: According to the Victorian Place Names Committee the correct spelling is Bundara, and not Bundarrah or Bundarra. Bundarrah appears on most of the older maps, or occasionally Bundarra. The spelling Bundara is in accordance with the more recent Victorian Department of Crown Lands & Survey maps, and also the Commonwealth 1 : 250,000 Series (1968) — (Tallangatta).

Specimens Examined: The location given above for the S.M. Fawcett collection appears to be slightly misleading, as it suggests that the specimen was collected at or near Anglers Rest. It is almost certain that the collection was made at or near Bundara Bridge—which is close to the junction of the Bundara and the Big River. This is about 1–3 kilometres north of Anglers Rest. After considerable searching around Anglers Rest, R. V. Smith was not able to find *G. willisii* there, whereas it is abundant at Bundara Bridge.

Presence of a micro-lichen: The generally dark grey to blackish colour of the branches is partly due to the presence of dark coloured hairs mixed with the predominantly light greyish white hairs; but is also due to the presence of the black fruiting bodies of a micro-lichen which is present in considerable quantity on both the stems and branches, also on the flowering rhachis, and with scattered occurrences on both the upper and lower leaf surfaces.

The new species is dedicated to Dr. J. H. Willis, whose enthusiasm, industry and skill have greatly enriched our knowledge of the Australian Flora.

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